ABSTRACT OF THE INVENTION

Method and system for supporting speculative modification in a data cache are provided and described. A data cache comprises a plurality of cache lines. Each cache line includes a state indicator for indicating anyone of a plurality of states, wherein the plurality of states includes a speculative state to enable keeping track of speculative modification to data in the respective cache line. The speculative state enables a speculative modification to the data in the respective cache line to be made permanent in response to a first operation performed upon reaching a particular instruction boundary during speculative execution of instructions. Further, the speculative state enables the speculative modification to the data in the respective cache line to be undone in response to a second operation performed upon failing to reach the particular instruction boundary during speculative execution of instructions.